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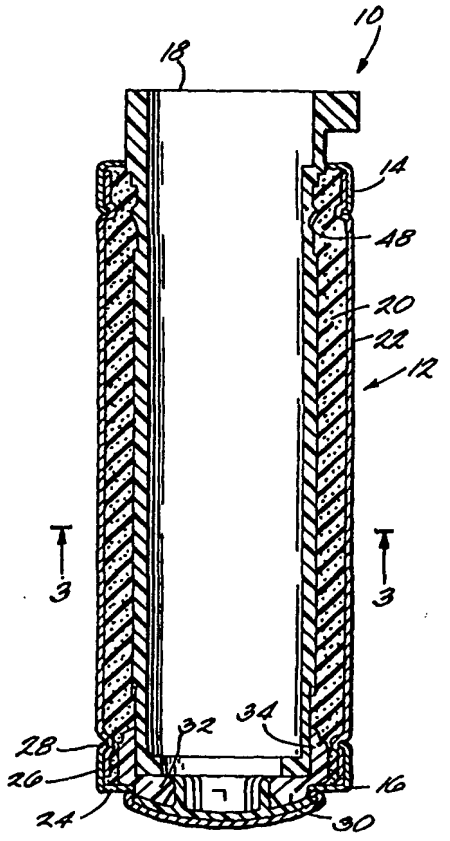
(54) Title: VEHICLE HAND GRIP AND PROCESS FOR MANUFACTURING THE SAME

(57) Abstract

A process of manufacturing a hand grip assembly for a vehicle such as a motorcycle, including the steps of producing a flexible sleeve (22) that defines an interior, inserting the flexible sleeve (22) into a mold (60) configured to hold the flexible sleeve (22), injecting moldable material (20) into the interior of the flexible sleeve (22), and solidifying the moldable material (20) and adhering the moldable material (20) to the flexible sleeve (22) to thereby form the hand grip assembly. The process preferably results in handgrip assembly wherein the interior surface of the flexible sleeve (22) is embedded into the moldable material (20). The flexible sleeve (22) is made of a flexible fabric such as leather and the resilient material (20) is a thermoplastic elastomer.



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VEHICLE HAND GRIP AND PROCESS FOR MANUFACTURING THE SAME

FIELD OF THE INVENTION

The present invention generally relates to the field of hand grips, and more specifically to leather wrapped hand grips for motorcycles.

BACKGROUND OF THE INVENTION

The hand grips of a motorcycle may greatly affect the rider's perception of the motorcycle and the rider's control of the motorcycle. Not only do they need to appropriately fit the rider's hand, but also they may insulate the rider from vibration of the motorcycle handle bars, and are therefore important to the enjoyment of the motorcycle on longer rides. Also, because they are the part most directly contacted by the operator of the motorcycle, they must be aesthetically pleasing to the rider and offer an acceptable feel. Accordingly, motorcycle hand grips are often customized to the individual rider's tastes. Motorcycle hand grips are manufactured from different materials, however, the construction must be sturdy and durable, and preferably should be relatively simple and inexpensive.

SUMMARY OF THE INVENTION

The present invention provides a process for manufacturing a hand grip assembly for a vehicle such as a motorcycle. The process includes the steps of producing a flexible sleeve that defines an interior, inserting the flexible sleeve into a mold configured to hold the flexible sleeve, injecting moldable material (e.g., plastic such as a thermoplastic elastomer) into the interior of the flexible sleeve, and solidifying the moldable material and adhering the moldable material to the flexible sleeve to thereby form the hand grip assembly.

The flexible sleeve preferably has inner and outer ends, and the process further includes the step of

positioning at least one of the inner and outer ends in a ring. The ring can be inserted into the mold before the injecting step.

Preferably, the step of producing the flexible sleeve includes the steps of providing a sheet of flexible fabric (e.g., leather) having ends, looping the sheet of flexible fabric end-to-end, and joining the ends of the sheet of flexible fabric. The joining step can include fixing a clip to the ends, and positioning the clip in the interior of the flexible sleeve.

In one embodiment, the process further includes the step of inserting an endcap spacer into the mold before the injecting step. In this embodiment, the process can further include the step of attaching an endcap to the endcap spacer. The injecting step preferably includes injecting the moldable material through a hole in the endcap spacer.

The above-described process can be used to produce a hand grip assembly comprising a flexible sleeve having an interior and an inner surface facing the interior, and a mass of resilient material having a cylindrical portion positioned in the interior of the flexible sleeve and embedded in the inner surface. Leather is very desirable as a hand grip material because it is comfortable, provides excellent grip, is durable, and provides a very traditional appearance. The surface of the leather may be textured in any number of ways to reflect the rider's individual tastes. The resilient material in the hand grip assembly is desirable because the resilient material will absorb vibration, thereby enhancing the longer term comfort of the rider. By embedding the inner surface of the flexible sleeve in the resilient material, a durable and cohesive hand grip assembly in achieved.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a throttle side motorcycle hand grip assembly embodying the present invention.

Fig. 2 is a cross-sectional view of the hand grip assembly along line 2-2 of Fig. 1.

Fig. 3 is a cross-sectional view of the hand grip assembly along line 3-3 of Fig. 2.

Fig. 4 is an enlarged side view of the endcap spacer.

Fig. 5 is an enlarged cross-sectional view of the outer end of the hand grip assembly.

Fig. 6 is a perspective view of a flexible tube and a clip.

Fig. 7 is an exploded assembly view showing the parts of the hand grip assembly relative to the mold.

Before one embodiment of the invention is explained in detail, it is to be understood that the invention is not limited in its application to the details of the construction and the arrangements of processes set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is understood that the phraseology and terminology used herein is for the purpose of describing the illustrated embodiment and should not be regarded as limiting the scope of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figs. 1-5 illustrate a motorcycle hand grip assembly 10 embodying the present invention. As shown in Fig. 1, the hand grip assembly 10 includes a central portion 12, an inner ring 14 on an inner end of the central portion 12, an outer ring 16 on an outer end of the central portion 12, and a throttle sleeve 18 positioned within the central portion 12. The inner and outer ends are relative to the mounted position on

a motorcycle. That is, on the motorcycle the inner end will be directed inward towards the motorcycle, and the outer end will be directed away from the motorcycle.

The illustrated hand grip assembly 10 is a throttle side hand grip assembly, which includes the throttle sleeve 18 for engaging a throttle cable (not shown). A non-throttle side hand grip assembly is identical in structure, except without the throttle sleeve 18. Also, because the throttle sleeve 18 may be added to the hand grip assembly 10 as a final step in the manufacturing process, the majority of the manufacturing process may remain the same for the throttle side and non-throttle side hand grip assemblies.

Referring to Fig. 2, the central portion 12 includes a resilient member 20 and a flexible sleeve 22 covering the resilient member. The illustrated resilient member 20 is cylindrical in shape and extends substantially the entire length of the assembly 10. The resilient member 20 is made from a resilient material in order to dampen vibration from the motorcycle to the operator's hands. In a preferred embodiment, the resilient material includes a moldable thermoplastic elastomer.

As noted above, the flexible sleeve 22 is positioned over the resilient member 20. The outer surface of the flexible sleeve 22 is designed to be gripped by the motorcycle operator. In the preferred embodiment, the flexible sleeve 22 is made of a leather material for a durable and functional grip. The outer surface of the flexible sleeve 22 may be textured in any number of leather textures to suit the rider's tastes. The texture pattern shown in Fig. 1 is a pigskin design.

The inner and outer rings 14,16 are provided in order to enhance the function and aesthetics of the hand grip assembly 10. Each ring includes an annular portion 24 forming the end of the assembly 10, a

What is claimed is:

1. A process for manufacturing a hand grip assembly for a vehicle, the process comprising:

producing a flexible sleeve that defines an interior;

inserting the flexible sleeve into a mold configured to hold the flexible sleeve;

injecting moldable material into the interior of the flexible sleeve; and

solidifying the moldable material and adhering the moldable material to the flexible sleeve to thereby form the hand grip assembly.

2. The process of Claim 1, wherein the moldable material is a plastic.

3. The process of Claim 1, wherein the moldable material is a thermoplastic elastomer.

4. The process of Claim 1, wherein said producing step comprises:

providing a sheet of flexible fabric having ends;

looping the sheet of flexible fabric end-to-end; and

joining the ends of the sheet of flexible fabric.

5. The process of Claim 4 wherein the flexible fabric comprises a sheet of leather.

6. The process of Claim 4, wherein said joining step includes fixing a clip to the ends, and positioning the clip in the interior of the flexible sleeve.

cylindrical portion 26 connected to the annular portion 24, and a lip portion 28. The rings 14,16 are positioned over the ends of the flexible sleeve 22 such that there is an overlap between the rings 14,16 and the flexible sleeve 22. Because the sleeve 22 is flexible, it can conform to the curvature of the inner surface of the rings 14,16 and seal against a lip portion 28 and cylindrical portion 26 on each ring 14,16. The inner and outer rings 14,16 preferably are made of chrome-plated metal.

At the outer end of the hand grip assembly 10, an endcap spacer 30 is embedded into the resilient member 20. The endcap spacer 30 is shown enlarged in Fig. 4. The endcap spacer 30 includes a central disk portion 32 and eight fingers 34 extending from the disk portion 32. The central disk portion 32 includes an central aperture 36 that is designed to facilitate engagement with an endcap 40. The aperture 36 includes a shoulder 42 that is designed to engage a lip 44 of the endcap 40 (Fig. 5). As shown in Fig. 2, the fingers 34 are sized to fit between the throttle sleeve 18 and the flexible sleeve 22. The flexible sleeve 22 is pinched against the lip portion 28 of the outer ring 16 by the fingers 34.

A pair of holes 46 are provided through the central disk portion 32 of the endcap spacer 30 between the fingers 34 (Fig. 5). The holes 46 provide a pathway for injection of moldable resilient material to form the resilient member 20 during manufacture of the hand grip assembly 10, as described below in more detail.

The throttle sleeve 18 is positioned within the interior of the resilient member 20. At the inner end, the throttle sleeve 18 is sized to fit inside the inner ring 14. The throttle sleeve 18 includes a circumferential rib 48 to secure the sleeve 18 from moving longitudinally relative to the resilient member 20. As shown in Fig. 3, the throttle sleeve 18 also

includes a longitudinal rib 50 to prevent relative rotation between the throttle sleeve 18 and the resilient member 20.

Fig. 6 illustrates the manufacture of the flexible sleeve 22. The flexible sleeve 22 is made of a rectangular sheet 52 of leather that is looped end-to-end to form a tube. The ends of the tube are directed radially inward, and a clip 54 is pressed over the ends and clamped firmly in place. The clip 54 has a plurality of teeth to bite into the ends of the sheet 52. The inner surface 56 or inward side of the sheet 52 preferably has a matted texture. The matted texture will help to integrate the resilient member 20 with the leather sheet 52.

Fig. 7 illustrates the hand grip assembly 10 being assembled in a mold 60. The mold 60 has two halves 62 defining a cylindrical opening sized to fit the outer diameter of the flexible sleeve 22, and a mold core 64 provided to form the inner diameter of the assembly 10. The process is initiated by positioning the flexible sleeve 22, the inner and outer rings 14,16, and the endcap spacer 30 into the mold 60. When in position within the mold 60, the ends of the flexible sleeve 22 overlap with the inner and outer rings 14,16. The two mold halves 62 are then closed around these parts. The mold core 64 is inserted into the flexible sleeve 22 from the inner end, and a mold injector 66 closes over the endcap spacer 30 (i.e., on the outer end). The mold injector 66 has two injector ports 68 that line up with the holes 46 in the endcap spacer 30 to inject the moldable material into the hand grip assembly 10. The moldable material is injected and fills the interior of the hand grip assembly 10, between the flexible sleeve 22 and the mold core 64. The inner ring 14 and outer ring 16 are positioned over a portion of the flexible sleeve 22, such that the flexible sleeve 22 is forced against the rings 14,16 under pressure and seals the interior.

As the moldable material cools and is formed into its final shape, it becomes embedded into the matted inner surface 56 of the flexible sleeve 22, thereby forming a cohesive and durable article. Lastly, the throttle sleeve 18 may be inserted into the resilient member 20, and the endcap 40 may be snapped onto the endcap spacer 30.

While the several embodiments of the present invention has been shown and described, alternative embodiments will be apparent to those skilled in the art and are within the intended scope of the present invention. Therefore, the invention is to be limited only by the following claims.

7. The process of Claim 1, wherein the flexible sleeve has inner and outer ends, and further comprising the step of positioning at least one of the inner and outer ends in a ring.

8. The process of Claim 7, further comprising the step of inserting the ring into the mold.

9. The process of Claim 7, wherein said positioning step occurs before said injecting step.

10. The process of Claim 1, further comprising the step of inserting an endcap spacer into the mold before said injecting step.

11. The process of Claim 10, further comprising the step of attaching an endcap to the endcap spacer.

12. The process of Claim 10, wherein said injecting step comprises injecting the moldable material through a hole in the endcap spacer.

13. The process of Claim 1, wherein said inserting step includes positioning a die core in the interior of the flexible sleeve.

14. A hand grip assembly, comprising:

a flexible sleeve having an interior and an inner surface facing the interior; and

a resilient member having a cylindrical portion positioned in the interior of said flexible sleeve and embedded in said inner surface.

15. The hand grip assembly of Claim 14, wherein said flexible sleeve comprises a sheet of leather.

16. The hand grip assembly of Claim 15, wherein said sheet of leather includes ends that are looped to form a sleeve, and further comprising a clip that fastens said ends of said sheet of leather together.

17. The hand grip assembly of Claim 14, wherein said resilient member comprises moldable plastic.

18. The hand grip assembly of Claim 14, further comprising an endcap spacer that is embedded in said resilient member.

19. The hand grip assembly of Claim 18, wherein said endcap spacer includes a hole for injecting material through said endcap spacer.

20. The hand grip assembly of Claim 18, further comprising an endcap engaged with said endcap spacer.

21. The hand grip assembly of Claim 14, wherein said hand grip assembly has inner and outer ends, further comprising a ring positioned at one of the inner and outer ends.

22. The hand grip assembly of Claim 21, wherein said ring is overlapped with a portion of said flexible sleeve.

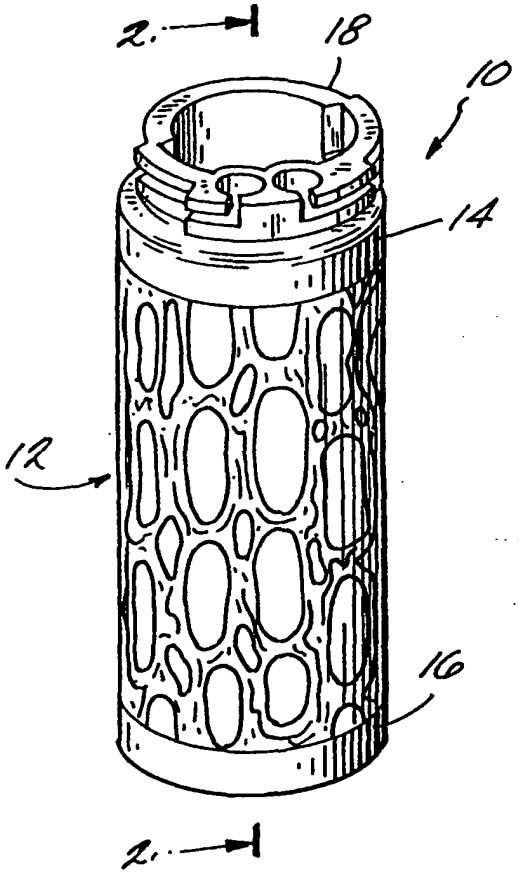

Fig. 1

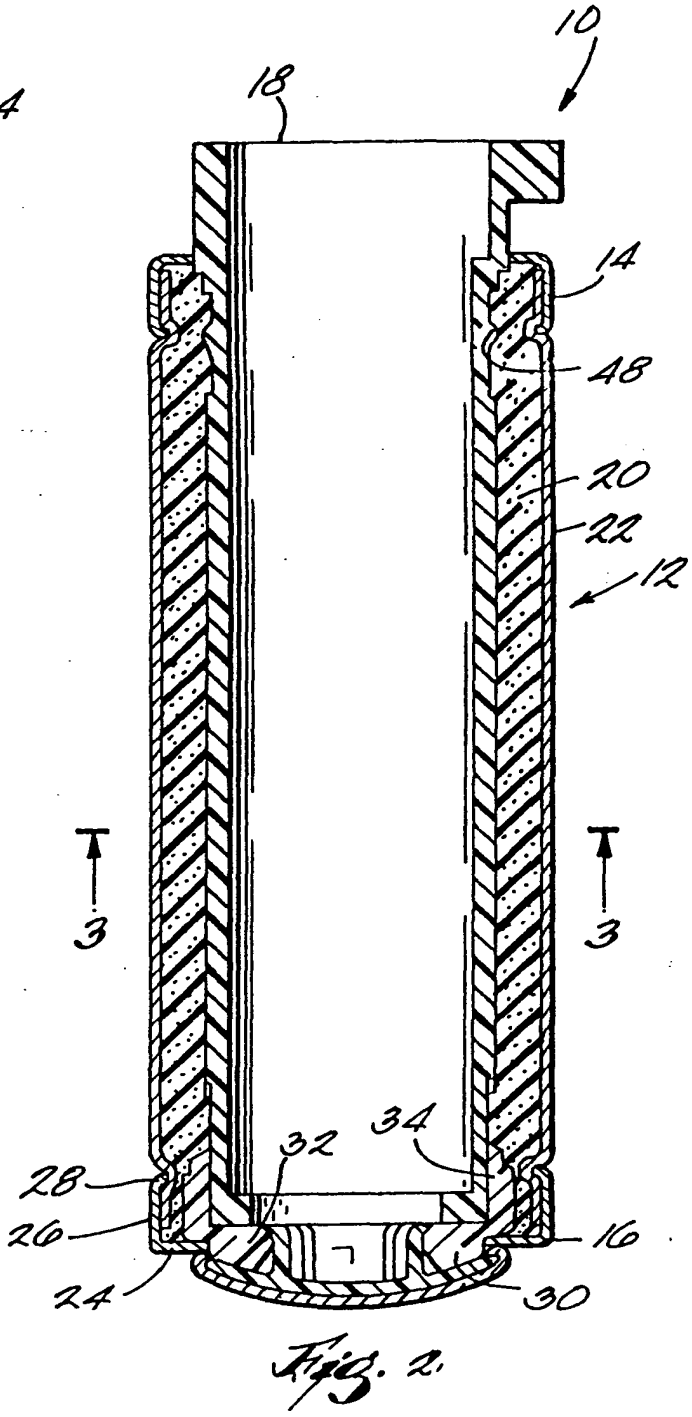

Fig. 2

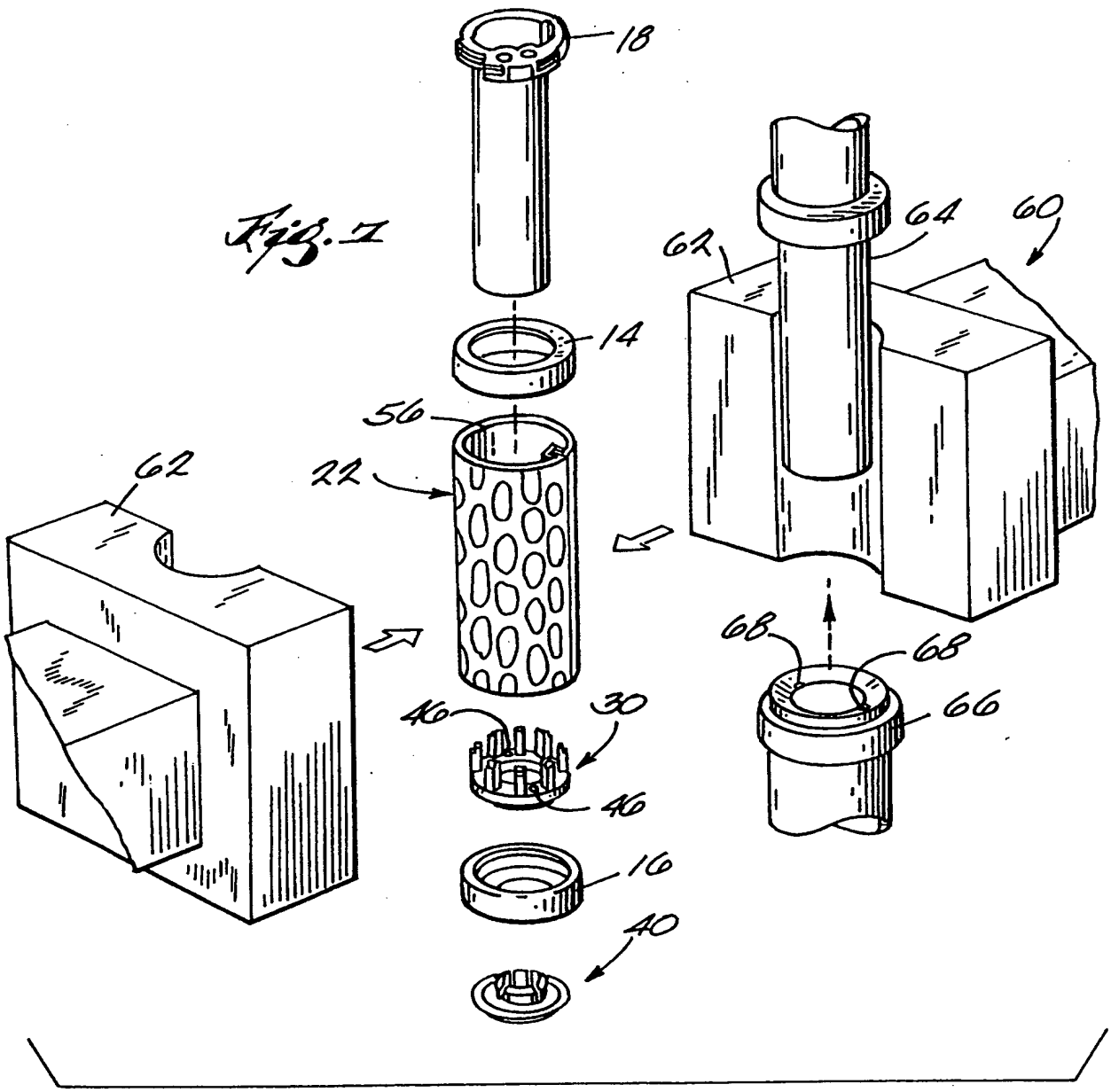

Fig. 1

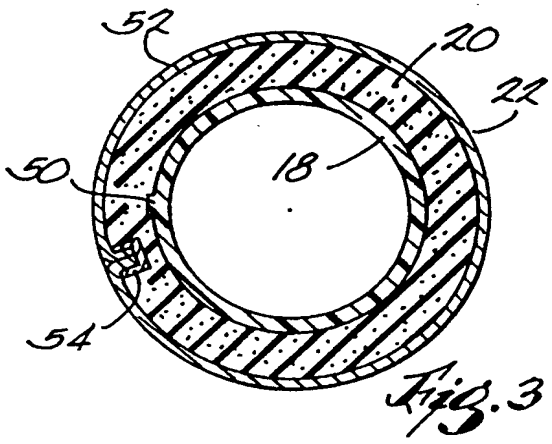

Fig. 3

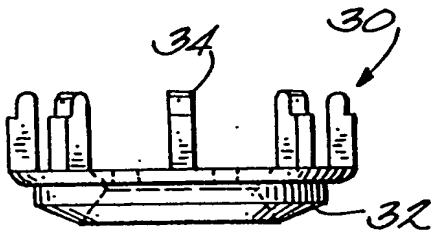

Fig. 4

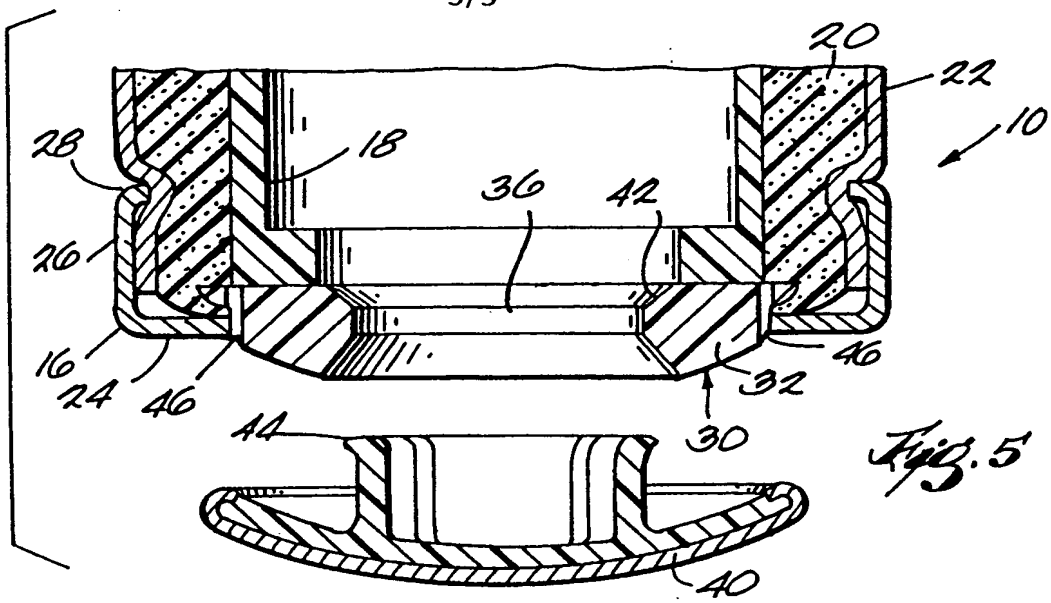

Fig. 5

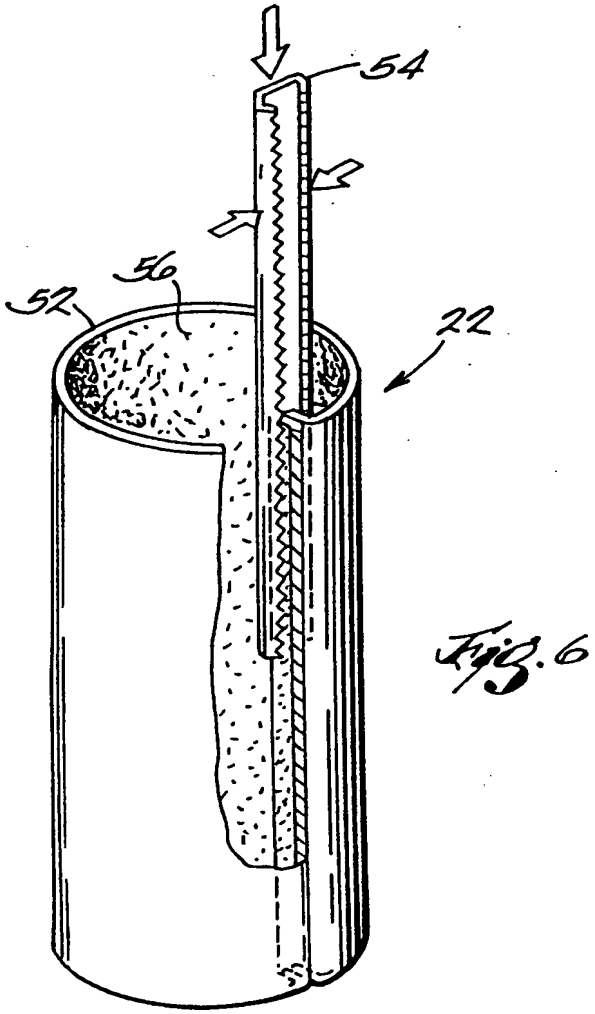

Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/01601

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B29D 27/00
US CL : 74/551.9; 264/275

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 74/551.1, 551.9; 403/309, 310, 313; 16/110R, 111R, 114R, DIG12; 81/177.1, 489; 264/273, 274, 275, 257, 279

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 4,338,270 A (UFFINDELL) 06 JULY 1982 (06.07.82), see entire document.	1-3,7-10,12-14, 17-19 --- 4-6,11
X --- Y	US 701,437 A (WHEELER) 03 JUNE 1902 (03.06.02), see entire document.	14,15,21,22 --- 16,20
Y, P	US 5,811,053 A (OTA ET AL.) 22 SEPTEMBER 1998 (22.09.98), see entire document.	4,5
Y	US 4,839,472 A (PICHLER) 13 JUNE 1989 (13.06.89), see fig. 1.	6,16
Y	US 5,640,741 A (YANO) 24 JUNE 1997 (24.06.97), see fig. 6.	11,20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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